



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Lifetime intellectual function and satisfaction with life in old age: longitudinal cohort study

Citation for published version:

Gow, AJ, Whiteman, MC, Pattie, A, Whalley, L, Starr, J & Deary, IJ 2005, 'Lifetime intellectual function and satisfaction with life in old age: longitudinal cohort study', *British Medical Journal (BMJ)*, vol. 331, no. 7509, pp. 141-142. <https://doi.org/10.1136/bmj.38531.675660.F7>

Digital Object Identifier (DOI):

[10.1136/bmj.38531.675660.F7](https://doi.org/10.1136/bmj.38531.675660.F7)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Publisher's PDF, also known as Version of record

Published In:

British Medical Journal (BMJ)

Publisher Rights Statement:

©Gow, A. J., Whiteman, M. C., Pattie, A., Whalley, L., Starr, J., & Deary, I. J. (2005). Lifetime intellectual function and satisfaction with life in old age: longitudinal cohort study. *BMJ*, 331(7509), 141-142doi: 10.1136/bmj.38531.675660.F7

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



What is already known on this topic

Although European Directive 95/46/EC allows national law (or a national supervisory body) to exempt healthcare or disease registries from the requirement to obtain informed consent for the processing of personal medical data, many countries have not legislated for any exemptions and there is much debate about the effect of the consent requirement on epidemiological research and surveillance

What this study adds

The logistical difficulties in obtaining informed consent is a serious threat to the operation of registries that rely on clinician notification or access to medical records, despite extremely low parental refusal

Debate about the right of the individual to be adequately informed and to give consent has eclipsed discussion about research governance and confidentiality procedures that might obviate the need for individual consent

Contributors: All authors are members of the Eurocat Working Group on Ethics and Confidentiality (chair AR; cochair AB) and were involved in the development of the questionnaire and commented on drafts of the paper. AB and HD drafted the paper. AB and NC coordinated data collection. AB analysed the questionnaire data. AR, HDW, IRG, MG, RM, and VN completed questionnaires giving information on ethics and confidentiality in their registries. All authors are guarantors.

Funding: Eurocat is supported by the EU Commission Public Health Directorate Public Health Programme.

Competing interests: None declared.

Ethical approval: All registries have ethical approval appropriate to their national and local ethics guidelines. The following registry leaders or members completed questionnaires giving information on ethics and confidentiality in their registries, and commented on the final draft of the paper: Lenore Abramsky, Neus Baena, Rosa Caballin, Eva Bermejo, Maria-Luisa Martínez Frias, Sebastiano Bianca, Alessandro Bonato, Romano Tenconi, Patricia Boyd, Mary Bythell, Martin Ward Platt, Maria Feijoo, Ester Garne, Blanca Gener, Yves Gillerot, Martin Haeusler, Anna Latos-Bielenska, Ruth Meikle, Isabel Portal Rolland, Carmen Mosquera-Tenreiro, Amanda Neville, Elisa Calzolari, Mary O'Mahoney, Anna Pierini, Fabrizio Bianchi, Annette Queisser-Luft, Gioacchino Scarano, Volker Steinbicker, Claude Stoll, David Tucker, and Diana Wellesley.

Antwerp Registry,
Provinciaal Instituut
voor Hygiene,
Antwerpen, Belgium
Vera Nelen
registry leader

Glasgow Registry,
Yorkhill Hospital,
Glasgow G3 8SJ
David Stone
registry leader

Correspondence to:
H Dolk
h.dolk@ulster.ac.uk

- 1 Busby AL, Ritvanen A, Dolk H, Armstrong N, De Walle H, Riaño-Galán I, et al. Informed consent for congenital anomaly registration in Europe. www.eurocat.ulster.ac.uk/pubdata/Publications.html#EUROCAT%20Publications (accessed 5 Jul 2005).
- 2 Tu JV, Willison DJ, Silver FL, Fang J, Richards JA, Laupacis A, et al. Impracticability of informed consent in the registry of the Canadian stroke network. *N Engl J Med* 2004;350:1414-21.
- 3 Melton LJ. The threat to medical-records research. *N Engl J Med* 1997;337:1466-70.
- 4 Jacobsen SJ, Xia Z, Campion ME, Darby CH, Plevak MF, Seltman KD, et al. Potential effect of authorization bias on medical record research. *Mayo Clin Proc* 1999;74:330-8.
- 5 Verity C, Nicoll A, Manning D. Education and debate: consent, confidentiality, and the threat to public health surveillance. *BMJ* 2002;324:1210-3.

(Accepted 27 June 2005)

consent and also about data confidentiality and research ethics procedures that would be acceptable to the public. The primary concern of most patients is not the use of their data for research but inappropriate access to medical data, and there is insufficient debate about what safeguards to ensuring confidentiality and the appropriate use of personal data would be sufficient to replace the requirement for individual consent.

Lifetime intellectual function and satisfaction with life in old age: longitudinal cohort study

Alan J Gow, Martha C Whiteman, Alison Pattie, Lawrence Whalley, John Starr, Ian J Deary

What is successful ageing? Current opinion is that "cognitive vitality is essential to quality of life . . . in old age."¹ This depends substantially on people's cognitive ability from early life,² and on how much they decline from their cognitive peak in young adulthood. Early cognitive ability also affects physical health and even survival to old age.² But surely happiness and satisfaction with life are also key indices of successful ageing. Happiness was described as "the highest good and ultimate motivation for human action"³; this does not seem to be related to current cognitive ability.³ Cognitive level in youth and the amount of cognitive change across the lifespan are important indicators of cognitive vitality in old age. We examined a unique data set to investigate whether these factors are associated with people being happier.

Participants, methods, and results

The Lothian birth cohort 1921 is a relatively healthy group of 550 older people (mean mini-mental state examination 28.2 (standard deviation 1.7), range

18-30). They were given the same test of mental ability (a version of the Moray House test number 12) at mean ages 10.9 (0.3) and 79.1 (0.6) years old,² giving three cognitive measures: early life ability, late life ability, and lifetime cognitive change. Moray House test scores were converted to IQs (standardised to a mean of 100 (15) and adjusted for age at testing. To compute lifetime cognitive change we used the following process. IQ at age 11 was the independent variable in a linear regression with IQ at age 79 as the dependent variable; the standardised residual produced from this equation was used as the measure of lifetime cognitive change.

Participants were mailed⁴ the widely validated satisfaction with life scale.⁵ This scale has five statements requiring a response from strongly disagree (score 1) to strongly agree (score 7), which we summed to give a

Department of
Psychology,
University of
Edinburgh,
Edinburgh
EH8 9JZ
Alan J Gow
PhD research student
Martha C
Whiteman
lecturer in health
psychology
Alison Pattie
research associate
Ian J Deary
professor of
differential psychology
continued over

BMJ 2005;331:141-2

This article was posted on bmj.com on 6 July 2005: <http://bmj.com/cgi/doi/10.1136/bmj.38531.675660.F7>

Department of Mental Health Clinical Research Centre, University of Aberdeen, Aberdeen AB25 2ZH

Lawrence Whalley
professor of mental health

Department of Geriatric Medicine, University of Edinburgh, Edinburgh EH16 4SB

John Starr
consultant and senior lecturer

Correspondence to:
IJ Deary
Ian.Deary@ed.ac.uk

total from 5 to 35 (mean 25.3 (6.1)). Only participants with full cognitive and life satisfaction data were included ($n = 416$; 42.5% men); a further seven people were excluded who had mini mental state examination scores less than 24. Correlations between the satisfaction with life scale and IQ at age 11 ($r = 0.00$) and age 79 ($r = 0.04$) were not statistically significant. The relation between the satisfaction with life scale and cognitive change between ages 11 and 79 was also small and non-significant ($r = 0.05$, $P = 0.30$). The associations did not differ significantly between men and women.

Comment

In non-demented people aged about 80, satisfaction with life in late adulthood was unrelated to IQ in either childhood or late adulthood and to cognitive change in their lifetime. An association might have been expected as intelligence is a "highly valued resource in this society,"³ and cognition is viewed as a key outcome in ageing. The lack of a cognition-life satisfaction relation could be due to the fact that higher ability is equally likely to lead to positive (increasing one's resources through entry to better employment, for example), as well as negative outcomes (an awareness of alternative lifestyles or a striving for greater achievement), which may be used when judging subjective wellbeing.³ Shorter term changes in cognitive function may influence ratings of life satisfaction; continued assessment of the cohort will allow an investigation of this possibility. Or it might be that, if people have sufficient cognitive ability for important aspects of their lives, individual differences do not matter much, as suggested by Thomas Hobbes in *Leviathan*: "For such is the nature of men, that howsoever they may acknowledge many others to be more witty, or more eloquent, or more learned; Yet they will hardly believe there be many so wise as themselves: For they see their own wit at hand, and other mens at a distance. But this proveth rather that men are in that point equall, than unequall. For there is not ordinarily a greater signe of the equall distribution of any thing, than that every man is contented with his share."

The determinants of cognitive function and satisfaction with life are quite different: both are important for overall wellbeing. In promoting successful ageing it is necessary to know not only what protects cognition but also what predicts happiness.

Contributors: AJG analysed the data and drafted the paper. AP and MCW managed the study and collected the data. IJD planned the study, and IJD, LW, JS planned the cognitive data collection phase of the Lothian birth cohort 1921. All authors contributed to the editing of drafts. IJD is guarantor.

Funding: AJG holds a Royal Society of Edinburgh/Lloyds TSB Foundation for Scotland Studentship. LW holds a career development award from the Wellcome Trust. IJD is the recipient of a Royal Society-Wolfson Research Merit Award. The phases of the Lothian birth cohort 1921 were funded by the Biotechnology and Biological Sciences Research Council and the Chief Scientist Office of the Scottish Executive Health Department.

Competing interests: None declared.

What is already known on this topic

Cognitive vitality has an impact on many aspects of functioning in old age

Satisfaction with life is not related to current cognitive ability, but changes in a lifetime may be associated with satisfaction with life

What this study adds

Cognitive ability at age 11, cognitive ability at age 79, and changes in cognition in a lifetime are not associated with satisfaction with life in old age

Ethical approval: Lothian Research Ethics Committee approved the Lothian birth cohort 1921 study. All participants gave signed consent.

- 1 Fillit HM, Butler RN, O'Connell AW, Albert MS, Birren JE, Cotman CW, et al. Achieving and maintaining cognitive vitality with aging. *Mayo Clin Proc* 2002;77:681-96.
- 2 Deary IJ, Whiteman MC, Starr JM, Whalley LJ, Fox HC. The impact of childhood intelligence on later life: following up the Scottish Mental Surveys of 1932 and 1947. *J Pers Soc Psychol* 2004;86:130-47.
- 3 Diener E. Subjective well-being. *Psychol Bull* 1984;95:542-75.
- 4 Gow AJ, Whiteman MC, Pattie A, Deary IJ. The personality-intelligence interface: insights from an ageing cohort. *Pers Individ Dif* 2005 (in press). Published online www.sciencedirect.com, 12 May 2005, doi:10.1016/j.paid.2005.01.028.
- 5 Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess* 1985;49:71-5.

(Accepted 1 June 2005)

doi 10.1136/bmj.38531.675660.F7

Corrections and clarifications

Role of multivitamins and mineral supplements in preventing infections in elderly people: systematic review and meta-analysis of randomised controlled trials

Only after the publication of this article by Alia El-Kadiki and Alexander J Sutton (*BMJ* 2005;330:871, 16 Apr) did the authors and editors become aware that doubts had been raised about the validity of three of the trials included in this systematic review.

The *BMJ* and the authors agreed that further analysis would be helpful, and the authors have therefore conducted a sensitivity analysis excluding data from the three questionable trials. This is now published as a supplement to the original paper (see <http://bmj.com/cgi/content/full/bmj.38399.495648.8F/DC2>).

The effect on the three outcome measures is as follows: (a) mean difference in number of days spent with infection: only the three questionable studies met the inclusion criteria, so the originally published beneficial difference of 17.5 (95% confidence interval 11 to 24) days is now completely discounted; (b) odds ratio of at least one infection in the study period: no change from published meta-analysis; (c) incidence rate ratio for the difference in infection rates: exclusion of the one questionable trial that was relevant to this outcome means that the pooled incidence rate is now 1.00 (0.85 to 1.17), not 0.89 (0.78 to 1.03) as published.

If the allegations that these three studies are not reliable are true then the remaining evidence base suggests no benefit for the use of multivitamins for preventing infections in elderly people.